

STATE OF MAINE OFFICE OF INFORMATION TECHNOLOGY

Application Deployment Certification Handbook (Guidelines and Procedures)

Application Deployment Certification Guidelines

REVISION HISTORY

Version	Date	Author(s)	Revision Notes
1.0	3/14/2011	Workgroup	Initial Version

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1. Preface

The purpose of the State of Maine Application Deployment Certification policy is stated as:

'As applications have become more complex, more interconnected, and more exposed to the external world, it has become even more important to thoroughly vet them before they are deployed into production. This policy establishes a uniform and objective battery of tests that enables the CIO to evaluate the suitability of an application to be deployed into production.'

The document includes Guidelines to assist in the facilitation of the testing required to meet the Applications Deployment Certification policy. Along with the <u>Application Deployment Policy</u>, the Project Managers / Product Managers responsible for application deployment certification tasks should use these as general guidelines for:

- Determining for each certification test type what level of testing is appropriate for their particular application; dependent on deployment type; i.e. "right sizing" to adapt to circumstances, while meeting the intent of the policy.
- Roles and responsibilities –identifying who is involved in deployment certification activities
- Guidelines are provided for all types of applications (new applications, enhanced applications, COTS, and vendor hosted), and for four deployment types: New Development, Enhancement/Utility Release, Emergency, and Hosting Environment Change. These expanded deployment type definitions are in the Glossary – Section 6.
- Web Service changes are to be tested following the same guidelines as any other application change.
- Hosting Environment Changes, New Application, Major Enhancements, Legacy systems
 that are undergoing certification for the first time, and minor upgrades may require
 variations to the testing approach. The Application Project / Product Managers may use
 discretion in making exceptions based on the guidelines and should document any
 variations in the Application Certification Test Summary Found of the OIT Application
 Deployment Certification Signoff document.
- Touch points throughout the SDLC for Application Development and Enhancements.

The objective of these guidelines is to provide a path for a "generic" application. Testing should be value added, reducing risk to the State, and generally using common sense. Due diligence should apply to testing for any level of change to ensure data integrity and security, application stability, and application availability. In all cases, the decisions and assumptions made in determining what testing applies should be documented. The Applications owners are the decision makers, and are ultimately accountable for ensuring the completeness and appropriateness of testing.

2. Test Guidelines Per Deployment Type

As described in the <u>Application Deployment Policy</u>, the following tests must be conducted and passed for all deployments. Rationale for any exceptions must be documented in the Application Deployment Test Summary document. Refer to the policy for expanded definitions of each test type.

Exit Criteria for all Tests – required for successful or conditional completion follows:

- 1. Business team satisfied the application meets expectations
- 2. Business management approved any known/remaining issue
- 3. Test results documented and stored in agreed on repository

Other Testing Guidance

- 1. Test and Production environment must be close enough in structure for tests to be relevant
- 2. Testing should begin early in development, rather than after promoting it to a test environment ... simply because if there are code changes surfaced by these tools, the earlier the better.
- 3. Security & Performance tests must be performed after a demonstrated code-freeze.

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Legend for Test Per Deployment Types: R = Required; E = Exceptions, i.e. variations (less stringent) for some requirements at discretion of the project manager; N = Test Execution Not Required				Deploy	ment Type	
Test Type	Tests / Exceptions	Process	New	Utility / Enhancement	Emergency	Hosting Environment Change
Use Case	Tests: 1. Use cases and test scenarios targeting all new and/or /changed functions (vendor may provide when a vendor app) Exceptions/Considerations: 1. Emergency deployments - only need if introduce new functionality; and then need only simple list of tests/results. 2. Hosting environment change - need only selected subset of Use Cases.	2. Obtain business team input3. Define test repository for	R	R	E	E

State of Maine Application Deployment Certification Guideline				
Language Dev Dev Language Town				
Legend for Test Per Deployment Types:	Deployment Type			

R = Required; E = Exceptions, i.e. variations (less stringent) for some							
requirements at discretion of the project manager; N = Test Execution Not							
Required							

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Test Type	Tests / Exceptions	Process	New	Utility / Enhancement	Emergency	Hosting Environment Change
Regression	Tests: 1. Existing function Use case and test scenarios targeting a core suite of essential functions (generally selected on a risk based approach) Exceptions/Considerations: 1. Applies only to existing applications; new applications have nothing to regression test 2. Emergency: extent of tests can be scaled back at product manager discretion. 3. Considerations: Manual testing may be appropriate 4. Care should be exercised here, it is just during rushed emergency deployments that testing should be reinforced and exercised. If not, significant harm could result.	Process: 1. Identify and prepare test cases, scenarios, tools. 2. Obtain business team input 3. Define test repository for cases and results 4. Execute tests during the Acceptance Test Phase Entry Criteria: Developer executed / 'passed' IT Tests Exit: Criteria: See standard criteria in this section introduction	Z	R	E	E

Legend for Test Per Deployment Types:	
R = Required; E = Exceptions, i.e. variations (less stringent) for some	Deployment Type
requirements at discretion of the project manager; N = Test Execution Not	Deployment Type
Required	

Test Type	Tests / Exceptions	Process	New	Utility / Enhancement	Emergency	Hosting Environment Change
Data	Tests:	Process:	Е	R	N	N
Conversion	1.Test scenarios for viewing accurate mapping of all identified business critical data and functions Exceptions/Considerations: 1. Need only when have data conversions requirements. 2. Not needed for version upgrades, emergency prod fixes new apps when no legacy app exists, etc. 3. Not required for existing prod system retro-cert.	 Identify and prepare test cases, scenarios, tools. Prepare 'Pre-Test' data reports and screen shots Obtain business team input Define test repository for cases and results Execute tests during the Acceptance Test Phase Prepare 'Post-Test' data reports and screen shots prepared Validate 'Post' Results data accurate Entry Criteria: Executed / 'passed' IT Tests Exit Criteria: See standard criteria in this section introduction 				

Legend for Test Per Deployment Types: R = Required; E = Exceptions, i.e. variations (less stringent) for some requirements at discretion of the project manager; N = Test Execution Not Required			Deployment Type			
Test Type	Tests / Exceptions	Utility /		Emergency	Hosting Environment Change	

Interfaces	Tests:	Process:	R	R	Е	R
	1. Test cases/scenarios for	1. Identify and prepare test				
	viewing accurate input/export to	cases, scenarios, tools.				
	business critical	2. Prepare 'Pre-Test' data				
	interfacing data and functions	reports and screen shots				
	Exceptions/Considerations:	2. Obtain business team				
	Only Acceptance test	input				
	required for COTS, Vendor	3. Define test repository for				
	Developed and Hosted Test.	cases and results				
	2. Not required for existing	4. Execute tests during the				
	prod system retro-cert.	Acceptance Test				
		Phase				
		5. Prepare 'Post-Test' data				
		reports and screen shots				
		prepared				
		6. Validate 'Post' Results				
		data accurate Entry Criteria:				
		Developer executed / 'passed'				
		IT Tests Exit Criteria:				
		See standard criteria in this				
		section introduction				

Performance Tests: 1. Te	est cases/scenarios for	Process: 1. Identify and prepare test	R	E	E	E
	iers: <u>Tier 1:</u> Individual	cases, scenarios, tools.				
	omponent response	2. Obtain business team				
/turnaroun	nd times (screens, batch	performance requirements as input				
jobs, etc.		3. Define test repositoriesy for				
<u>Tier 2:</u>	•	cases and results				
appropriat		4. Execute tests in test				
	er population	environment &/or prior to code				
	twork Profile efficiency	freeze 5. Execute platform tests again				
	st case/scenarios for	in pre-prod and prod environments				
stated		after code freeze for final results.				
	performance	Entry Criteria:				
	ents 3. Legacy	Execute platform tests in pre-prod				
	Platform Tests: es between pre-	and prod environments after code				
	and production	freeze for final results.				
	ents, validating the					
	ability, failover, and	Exit Criteria:				
	ncing configurations	See standard criteria in this section				
Exception	ns/Considerations:	introduction				
1. Sn	nall & Medium: In-house					
Developed	d:					
	est cases for typical user					
- I	exclude 'simulated load					
	profile' tests					
	nall: Vendor / COTS:					
	est cases with typical vior; exclude 'simulated					
	twork profile' tests 3.					
	cy: Test post					
	tation - using Small					
criteria (se						
	r releases other than					
new, Perfo	ormance Tests may be					

operationalized, allowing for conditional approvals. Operationalized means system-wide testing on a periodic basis, such as annually. 5. Considerations: use automated tools as much as possible fro for applicable type and size releases - SoM can test up to 1000 virtual users with automated tool			

	Legend for Test Per Deplo equired; E = Exceptions, i.e. variation nents at discretion of the project ma Required	ons (less stringent) for some		Deploy	ment Type	
Test Type	Tests / Exceptions	Process	New	Utility / Enhancement	Emergency	Hosting Environment Change
	Automated tool does not work on all technology - schedule manual monitoring for network components, databases, servers. 6. Performance Test must accommodate the Legacy Operating Platform Test: Differences between preproduction and production environments, and, more specifically, validating the highavailability, failover, and load balancing configurations, etc.					

	Legend for Test Per Deplo equired; E = Exceptions, i.e. variation ents at discretion of the project man Required	ons (less stringent) for some		Deploy	ment Type	
Test Type	Tests / Exceptions	Process	New	Utility / Enhancement	Emergency	Hosting Environment Change
Security	Tests: 1. Test scenarios for areas in State Security policies (see link in appendix 8): generally: login/authentication procedures, database security, passing of parameters and data through layers of application Exceptions/Considerations: 1. Emergency: ? 2. Note SoM tools only work on web applications and web services 3. Use automated test tools for all tests as possible 4. For releases other than new, Security Tests may be operationalized, allowing for conditional approvals. Operationalized means systemwide testing on a periodic basis, such as annually.	Process: 1. Obtain URL and credentials for a test environment. 2. Identify and prepare test cases, scenarios, tools. 3. Obtain app/SIG team input 4. For in-house apps, start tests when adopt logical architecture and authentication method 5, Execute tests in test environment &/or prior to code freeze Entry Criteria: Execute platform tests in preprod and prod environments after code freeze for final results. Exit Criteria: Waiver approved by CIO See standard criteria in this section introduction	R	E	E	E

	Legend for Test Per Deplo equired; E = Exceptions, i.e. variation ents at discretion of the project man Required	ons (less stringent) for some		Deploy	ment Type	
Test Type	Tests / Exceptions	Process	New	Utility / Enhancement	Emergency	Hosting Environment Change
Restoration	Tests: 1. Use case and test scenarios- select full suite or business critical suite 2. For new applications, this test will be performed on the production infrastructure BUT PRIOR TO opening it up to endusers (Go-Live). Exceptions/Considerations: 1. Utility/Enhancement & Emergency - Not needed if a version upgrade only.	Process: 1. Identify and prepare test cases, scenarios, tools. 2. Obtain business team input 3. Define test repository for cases and results 4. Execute tests during the IT & Acceptance Test Phase Entry Criteria: Developer executed / 'passed' IT Tests Exit Criteria: See standard criteria in this section introduction	R	E	E	R

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Application Deployment Certification Guidelines

3. Roles and Responsibilities

Notes:

- 1. Project Manager will coordinate all deployment certification activities within the project plan and to manage the team to meet the project plan/schedule.
- 2. In the absence of a Product Manager, the Application IT Manager will assume this role.
- 3. One person may be assigned multiple roles. In fact, often on the smaller systems, one person is the Product Manager, Application Technical Lead, and Project Manager.
- 4. The role(s) described is responsible for the actions; however, the responsibility may be delegated. It is recognized that application support teams may delegate this function to a single individual for multiple application releases.
- 5. In the table below: The Role(s) responsible for completing the activity is (are) indicated by an 'R' in the appropriate role column. The test types the activity must be performed for are indicated by an 'X' in each applicable Test Type column.

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				Role	s						Ар	plication Te	st - appli	cable		
Deployment Certification Activities	Prod. Mgr		OIT Tester	App Dev Team	Bus. Mgr	CIO, Assoc CIO, App Director	SIG	App Hosting	Use Case	Acces- sibility	Regression	Data Conversions	Interfaces	Sec- urity	Performance	Restor -ation
Lead, Coordination, Oversight - Activities:		R														
Review Application Certification Guidelines and define for the specific project, the scope of tests to be done (which tests, and to what extent) and when the tests need to be done.	R															
Determine who will be designated the ultimate approver(s) of the deployment certification.						R										

(See section 4 for guidance).														
Identify key end user to assist with testing (business tester)	R						X	X	Х	Х	Х			Х
Obtain key vendor rep to assist business tester for COTS/vendor hosted products	R							Х				X	X	Х
Schedule test timelines with testers (allow 1-2 weeks minimum for scheduling accessibility tester and security tester)		R					X	Х	X	X	X	X	X	Х
Provide, or approve if one exists; tracking tool/repository, for test results				R R			X	Х	Х	Х	Х	X	Х	Х
Facilitate remediation		R			R		Х	Х	Х	Х	X	Х	X	Х

and request retests as needed												
Request confirmation that all issues have been remediated and/or are acceptable to business	R				X	Х	X	X	X	X	Х	Х

					Roles	;						Ap	plication Te	st - applica	able	
Deployment Certification Activities	Prod. Mgr	Proj. Mgr	Bus. Tester	OIT Tester	App Dev Team	Bus. Mgr	CIO, Assoc CIO, App Director	SIG	App Hosting	Use Case	Acces-	Regression	Data Conversions	Interfaces	Sec- urity	Performance
Communicate requirements to interfacing Product/Project Mgrs & with App Hosting		R														
Store 'email' that application has passed in Application Deployment Certification document, OR Initiate waiver		R									X					

request with results													
Test Preparation Activities:		R	R				X	Х	X	Х	Х	X	X
Produce, or select from existing suite, use cases or business work flow to execute major parts of the application (Request vendor input as needed)		R		В			X	X	X				X
Produce, or select from test existing suite, appropriate manual or automated test cases				R	R	R						×	X
Produce data comparisons and work flow to identify critical data				R						Х			

Prepare for conversion results validation: identify and create 'pre & post' test reports and/or screen shots		R	R	R				X		
Define & set up and coordinate test preparation with interfacing dev resources & with App Hosting			R						X	
Test Execution Activities:										
Set up tests; coordinate test execution with interfacing dev resources & with App Hosting			R						X	X
Execute recovery tests (e.g. execute backup/restores)						R				

Roles Application Test - applic	olicable
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Deployment Certification Activities	Prod. Mgr	Proj. Mgr	Bus. Tester	OIT Tester	App Dev Team	Bus. Mgr	CIO, Assoc CIO, App Director	SIG	App Hosting	Use Case	Acces-	Regression	Data Conversions	Interfaces	Sec- urity	Performai
Execute use case tests			R							Х		Х				
Execute tests in application test environments					R			R							Χ	
Execute tests in "pre-production environment					R											X
Apply, monitor, provide output of performance monitoring tools in staging/acceptance' environment performance									R							X
Run test conversions			R		R								X			
Navigate use cases thru application; run screen reader (Estimate 2 hrs per app)			R	R							X					
Document Test Results Activities:																
Review and document conversion results			R										Х			

_	 										-				
data (reference pre & post reports or screens)															
Observe test; document results, scribe issues identified by OIT tester				R						X					
Obtain confirmation of issues from OIT tester. Get agreement on must have / nice to have			R	R						Х					
Obtain documented use case test results				R					Х		X				
Review results in application for accuracy		R											Х		
Obtain documented results				R			R							Х	Х
Approvals: ready for application certification signoff (OK test status including issues / or waivers)	R														
	Roles							Application Test - applicable							

Deployment Certification Activities	Prod. Mgr	Proj. Mgr	Bus. Tester	OIT Tester	App Dev Team	Bus. Mgr	CIO, Assoc CIO, App Director	SIG	App Hosting	Use Case	Acces-	Regression	Data Conversions	Interfaces	Sec- urity	Performa
Signoff to indicate acceptance of any remaining issues	R	R				R				Х	Х	X	Х	Х	X	Х
Support deployment certification testing successfully completed; submit for formal application certification approval		R								X	X	X	X	X	X	X

4. Approvals Per Deployment Types - Guidelines

Notes:

- 1. CIO/Associate CIO Applications approval is required across all deployment types where the deployment: a. affects entire enterprise b. introduces new technologies
 - c. presents high security risks
 - d. requires major re-engineering
 - e. has high public visibility
 - The approval will be made based upon advice from the PMO Director, the Application Director of record, the CTO and other subject matter experts.
- 2. Where the deployment does not meet the criteria above requiring the CIO/Associate CIO approval, the deployment certification approval will be delegated to the Application Director or in some cases to the IT Manager.
- 3. The CIO/Associate CIO Applications may request retaining signature approval for any deployment at their discretion.

5. Process Flow

New Systems and Enhancements/Utility Releases:

- 1. Development effort commences.
- 2. Product Manager and Project Manager meet to decide applicable tests.

 Product Manager makes the call, IT Manager/App Director are consulted and may direct decisions on tests.
- 3. Software release approver decided by App Director, or directed by CIO, Associate CIO Applications.
- 4. Project Manager ensures tests are included in project plan, including multiple iterations.
- 5. Tests are performed by assigned parties, with multiple iterations as necessary.
- 6. Tests results and any recommendations are fed back to project manager for compilation in the sign-off document.
- 7. Project Manager, Product Manager, and Business Sponsor provide their recommendation on the final approval
 - a. When CIO or Associate CIO Applications approval is necessary:
 - i. The Application Director must approve prior to reaching CIO or Associate CIO. ii. The CIO and Associate CIO Applications will seek advice from the PMO Director, the Application Director of record, the CTO and other subject matter experts.
- 8. Approval happens this is the Go/No Go decision for the release. In the event tests have conditional approvals, remediation plans will be required. a. Security Needs to have a waiver as well as a remediation plan, reviewed by Security Officer and Application Director, approved by CIO.

- Accessibility Needs to have a waiver as well as a remediation plan, reviewed by Accessibility Coordinator and Application Director, approved by CIO.
- 9. RFC put into place to document the change. CAB ensures there are no conflicts and back-out plan adequate.
- 10. Change happens.
- 11. Application Inventory updated as appropriate.

Emergency Changes:

- Effort commences.
- 2. Product Manager decides applicable tests, IT Manager/App Director are consulted and may direct decisions on tests.
- 3. Approver decided by App Director, or directed by CIO, Associate CIO Applications.
- 4. Tests results and any recommendations are fed back to Product Manager for compilation in the sign-off document.
- 5. Product Manager provides recommendation on the final approval
- 6. Approval happens this is the Go/No Go decision for the release. In the event tests have conditional approvals, remediation plans will be required.
- 7. RFC put into place to document the change. CAB ensures there are no conflicts and back-out plan adequate.
- 8. Change happens.
- 9. Application Inventory updated as appropriate.

Hosting Environment Changes:

- 1. Effort commences.
- 2. Product Manager decides applicable tests, IT Manager/App Director are consulted and may direct decisions on tests.
- 3. Approver decided by App Director, or directed by CIO, Associate CIO Applications.
- 4. Tests results and any recommendations are fed back to Product Manager for compilation in the sign-off document.
- 5. Product Manager provides recommendation on the final approval
- 6. Approval happens this is the Go/No Go decision for the release. In the event tests have conditional approvals, remediation plans will be required.
- 7. RFC put into place (by Application Hosting Team) to document the change. CAB ensures there are no conflicts and back-out plan adequate.
- 8. Change happens.
- 9. Application Inventory updated as appropriate.

6. Glossary

1. Deployment Type Criteria:

Deployment Type	Criteria
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New	All new development
Utility release / Enhancements	All change/enhancement releases of one or more, related or unrelated changes/enhancements of any size.
Emergency	Urgent rapid development and deployment
Hosting environment change	Change in the underlying platform, such as server and OS changes, but not hosting location changes.

2. Test Type Terminology:

Term	Definition
Tests	The types of tests cases / scenarios to be performed
Exceptions/Considerations	Variations by deployment type of test requirements that may be discretionary.
Entry Criteria	What must be done/in place before testing process steps can begin
Exit Criteria	Description of what comprises test completion

3. Other Definitions:

Term	Definition
SDLC	System Development Life Cycle
PM	Project Manager
PdM	Product Manager
RFC	Request for Change
Code Freeze	(from Wikipedia) ' point in time in the development process after which the rules for making changes to the source code or related resources become more strict, or the period during which those rules are applied.'
	The specific rules may vary by project and testing / release approach. Suggest the PM define the rules for the project at project initiation, with the team.

7. Application SDLC Considerations

The items in this section are meant to be guidelines (for those performing project management) for inclusion in the project plan for the development effort, whether it be new software, enhancement, or a utility release.

Considerations include:

- 1. Touch points with application hosting.
- 2. RFC
- 3. Application Inventory Update

Tasks typically part of **Application Deployment Certification** are **'bolded'** in the table below.

Туре	Format	Who	When	Intent	Lead/ Turnaround time for response from others
Define Project Code Freeze Specifics	Collaborative, Informal or Formal Meeting	PM Application Project Team	At project initiation	Establish consistent definition and rules for 'code freeze' for this project. E.g. at what phase freeze occurs, nature of freeze (allow bug fixes or strict with no changes [may apply when releasing in iterations]), etc	NA
Design Input	Collaborative, Informal or Formal Meeting	 App Technical Lead App Hosting Leads or tech staff as deemed appropriate by App Hosting leads 	 As close to project inception as possible At least once before coding begins Ongoing as needed 	Review with infrastructure resources, the application's logical architecture design Seek advice if physical infrastructure presents a perceived barrier or a "fork in the design road" is encountered	TBD

Design Finalization	Formal, "quasisign- off" event	■ App Technical Lead ■ App Hosting Leads	After design phase when desired architecture is defined and documented, and server needs identified	This is a collective review (not just App Hosting reviewing App's proposal) based on the collaborative interactions during the design development Final definition of scope which frames the certification requirements Defines anticipated timelines, level of effort from hosting team.	TBD
Project Meetings	Electronic via Outlook	Initiated by App Technical Lead or Project Manager	Regularly scheduled occurrences during project/ release timeframe	 To keep all parties (app and hosting teams) on same page of project To ensure checkpoints occur to evaluate new information as it occurs. 	NA
Scheduled Test Requests	Electronic via Footprints	 Initiated by App Lead Specific App Hosting or App Dev teams that are involved in the execution 	 Throughout testing phase Possibly during development phase if there is a need to validate a new 	Engage technical staff that administer tests	TBD

		of required tests	technical methodology		
Testing Feedback	Electronic	Documented test results delivered to App Lead by teams involved in testing	Upon completion of specific tests	Documentation of test results	TBD
RFC	Electronically submitted via Footprints	 Initiated by App Lead Reviewed by CAB 	Prior to the CAB meeting in advance of desired deployment date	 Ensure impacted teams aware of deployment activities, downtime, backup plan, risks Schedule all teams with handson role with deployment 	TBD
Update application inventory as applicable		■ App Lead		•	

Notes: These guidelines are necessary regardless of the Application Hosting Team, Core Technologies or Remote Hosted. Application Hosting Team is the infrastructure, including servers, instances/databases, and network.

8. Links to Relevant Policies

<u>Application Deployment Policy</u> <u>Infrastructure Deployment Certification Policy</u> **Remote Hosting Policy**

Waiver Policy

Accessibility Policies & Standards:

OIT - IT Policies, Standards, and Procedures

Security Policies & Standards:

OIT - IT Policies, Standards, and Procedures